ASSIGNMENT 10

Textbook Assignment: "Troubleshooting Transmissions, Transfer Cases, Power Takeoffs, and Differentials," and "Wheel and Track Alignment," pages 11-1 through 12-5.

10-1. In the power train, where is the sprag unit located?

1. In the axle housing
2. In the transmission
3. In the transfer case
4. In the PJO assembly

10-2. On a Spicer-manufactured transmission, what does the third digit of the serial number indicate?

1. The number of forward speeds
2. The transmission gear ratio
3. The year of manufacture
4. The type of gear synchronizer used

10-3. Which of the following conditions produces torsional vibrations that sound like noises in the transmission?

1. Worn universal joints
2. Loose U-bolts
3. Unbalanced wheels
4. Each of the above

10-4. A transmission that slips out of gear could have which of the following problems?

1. Broken gear teeth
2. Excessive main shaft end play
3. Low fluid level
4. Loose engine-mount bolts

10-5. What is the most common cause of transmission failure?

1. Leaking seals
2. Low fluid level
3. Normal wear
4. Improper operation

10-6. Soap and soda added to transmission lubricant acts in what way?

1. As a cleaning agent
2. As a sealing agent
3. To retard discoloration of the oil
4. To stiffen the oil

10-7. When should you check the fluid level in a standard transmission?

1. Directly after use
2. One-half hour after use
3. After the vehicle has been parked for several hours

10-8. In a standard transmission, excessive pressure is avoided by what means?

1. By the use of special fluids
2. By the use of a vent valve
3. By allowing for fluid expansion
4. By totally sealing the transmission

10-9. What seal cannot be inspected with the transmission installed?

1. The shift-rail seal
2. The output shaft seal
3. The input shaft seal
4. The fill plug seal

10-10. When a thin oil-type liquid is found beneath the flywheel housing, what is the most likely source?

1. Differential fluid
2. Transmission fluid
3. Engine oil
4. Transfer case fluid

10-11. When oil leaks from the front seal of the transmission, it may ruin the clutch.

1. True
2. False

10-12. For you to locate the mechanical problems of a transmission, what method is best?

1. Road testing
2. Component disassembly
3. Discussing the problem with the operator

10-13. When you hear a noise that only occurs when the clutch is disengaged, what is most likely the problem?

1. A mainshaft bearing
2. The input shaft
3. The clutch release bearing
4. A countershaft bearing

10-14. The incorrect alignment of a power train may cause sounds similar to a defective transmission.

1. True
2. False

10-15. A first and reverse gear in a standard transmission is usually of what design?

1. Helical
2. Herringbone
3. Spur
4. Hypoid

10-16. When is a standard transmission most likely to slip or jump out of gear?

1. During steady acceleration
2. During rapid acceleration
3. During steady deceleration
4. During rapid deceleration

10-17. If flushing is required, you should flush the transmission case with what type of liquid?

1. A special oil
2. Transmission lubricant
3. Solvent
4. Detergent

10-18. When determining whether or not to use an old transmission part, which of the following factors should you consider?

1. Serviceability of the old part
2. Cost of replacing the part
3. Availability of a new part
4. All of the above

10-19. You should coat transmission parts that are ready for reassembly with what type of liquid?

1. A light coating of clean transmission fluid
2. A medium-grade preservative lubricating oil
3. A rust-preventive compound
4. A fiber grease

10-20. In the transfer case, worn or broken gears, worn bearings, and excessive end play in the propeller shaft will cause what problem?

1. Clashing gears
2. Hard shifting
3. An unbalanced propeller shaft
4. Noisy operation

10-21. In an automotive vehicle, the power takeoff that supplies power to the auxiliary accessories can be attached to which of the following units of the power train?

1. Transmission
2. Auxiliary transmission
3. Transfer case
4. Each of the above

10-22. Within the power takeoff attachment, the shifter shaft is held in position by what means?

1. A shift lock
2. A fork
3. A spring-loaded ball
4. A sliding spur gear

10-23. Some vehicle power takeoff units have two speeds forward and one in reverse, whereas some have several forward speeds and a reverse gear. The power takeoff units with the several forward speeds are used to operate what units?

1. Power trains
2. Winches
3. Tracklayers
4. Front-wheel drives

10-24. A power takeoff assembly that slips out of gear could be caused by which of the following problems?

1. Bent or broken linkage
2. Faulty bearings
3. Broken gear teeth
4. Leaking shaft gears

10-25. Which component of a drive train is used to allow changes in the angle of the propeller shaft?

1. Support bearing
2. Companion flange
3. Slip joint
4. Universal joint

10-26. Lubricating universal joints with a low-pressure grease gun will prevent which of the following problems?

1. Bearing damage
2. Seal damage
3. Bearing seizure
4. Overlubrication

10-27. Which of the following is one purpose of the differential in the rear axle assembly of a wheeled vehicle?

1. To serve as a torque member
2. To make sure the rear wheels always turn at the same speed
3. To boost engine power transmitted to the wheels
4. To enable the axles to be driven as a single unit although turning at different speeds

10-28. What causes the pinions side gears and axle shafts to rotate as one unit?

1. Unequal wheel resistance
2. Equal wheel resistance
3. High-axle torque
4. Relative motion between the pinions

10-29. The average speed of the two differentials side gears is always equal to the speed of what components?

1. The drive shaft
2. The pinion gear
3. The wheels
4. The bevel drive gear

10-30. What is the name of the device that locks both axles together as a single unit?

1. A trunnion lock
2. The dog clutch
3. The side gears
4. The cone clutch

10-31. Compared to a standard differential, the high-traction differential for automotive vehicles combines pinions and side gears that have

1. fewer teeth but the same tooth form
2. more teeth but the same tooth form
3. fewer teeth and a modified tooth form
4. more teeth and a modified tooth form

10-32. In a no-spin differential, the wheel speed of the wheel with the least traction is controlled by what means?

1. The ring gear
2. The driver
3. The speed of the propeller shaft
4. The speed of the wheel applying the tractive effort

10-33. Which parts of the standard differential distinguish it from the no-spin differential?

1. Ring gear and spider
2. Pinions and side gears
3. Two driven clutch members with side teeth
4. Spring retainer and trunnions

10-34. In a differential, an improperly adjusted ring and pinion set would initially make what kind of sound?

1. Squealing
2. Humming
3. Clicking
4. Thumping

IN ANSWERING QUESTIONS 10-35 THROUGH 10-37, SELECT FROM COLUMN B THE TYPE OF AXLE THAT BEST FITS THE DESCRIPTION GIVEN IN COLUMN A. RESPONSES IN COLUMN B MAY BE USED ONCE, MORE THAN ONCE, OR NOT AT ALL.

A. DESCRIPTIONS	B. TYPES OF AXLES
10-35. The axle housing carries the weight of the vehicle because the wheels are supported by the bearings on the outer ends of the housing	1. Semi-floating axle 2. Three-quarter floating axle 3. Full-floating axle
10-36. Each wheel is carried on the end of the axle tube on two ball bearings or roller bearings and the axle shafts are bolted to the wheel hub	
10-37. The wheels are keyed or bolted to outer ends of the axle shafts and the outer bearings are between the shafts and housing	

10-38. At what level should the lubricant be maintained in the gear cases of vehicle power trains?

1. One inch below the inspection hole
2. Two inches below the inspection hole
3. Three inches below the inspection hole
4. Even with the bottom of the inspection hole

10-39. Overfilling the differential with fluid could cause the brakes to slip or grab.

1. True
2. False

10-40. When inspecting the power train of a vehicle, which of the following faults should mechanics look for?

1. Missing transmission bolts
2. Bent propeller shaft
3. Loose U-bolts
4. All of the above

10-41. Positive camber is the tilt of the top of the wheel in which direction?

1. In toward the engine
2. Outward away from the engine
3. To the rear of the vehicle
4. To the front of the vehicle

10-42. In what increments is camber measured?

1. Degrees
2. Fraction of an inch
3. Centimeters

10-43. What is one of the reasons camber is built into a vehicle?

1. To make cornering easier
2. To compensate for the loading effect on wheels
3. To relieve (partially) the pressure on springs
4. To assist in directional control

10-44. Primarily, camber is what kind of an angle?

1. Tracking angle
2. Toe-in angle
3. Tire-wearing angle
4. Nonadjustable angle

10-45. The forward or backward tilt of the kingpin or ball joint from the vertical line is termed as what angle?

1. Camber
2. Caster
3. Toe-in
4. Steering axis inclination

10-46. Caster is primarily what type of angle?

1. A toe-in angle
2. A tire-wearing angle
3. A turning angle
4. A direction control angle

10-47. In what increments is caster measured?

1. Degrees
2. Fractions of an inch
3. Centimeters

10-48. Positive caster is the tilt of the king pin or ball joint at the top in which direction?

1. In toward the engine
2. Away from the engine
3. Toward the front of the vehicle
4. Toward the rear of the vehicle

10-49. A tendency of a vehicle to maintain a straight-ahead course is due to what angle?

1. Positive camber
2. Positive caster
3. Negative camber
4. Negative caster

10-50. Negative caster tends to yield which of the following results?

1. Makes it easier for you to recover a vehicle from a turn
2. Decreases tire wear on the outside of tire tread
3. Makes the vehicle wander and weave
4. Makes the steering wheel more difficult for you to turn

10-51. Which of the following is true of caster?

1. It is nonadjustable
2. It is fixed
3. It is adjustable
4. It is automatically established

10-52. The inward tilt of the kingpin or ball joint from the true vertical line is known by what terminology?

1. Camber
2. Caster
3. SAI or KPI
4. Toe–in

10-53. In what increments is SAI or KPI measured?

1. Centimeters
2. Degrees
3. Fractions of an inch

10-54. What is one of the purposes of SAI or KPI?

1. To offset road crown
2. To prevent tire wear
3. To reduce the need for excessive camber
4. To prevent shimmy of the front wheels

10-55. Why is a vehicle closer to the road when the wheels are in a straight-ahead position than when they are turned?

1. Because of the angle of the spindle support arms
2. Because of the camber angle
3. Because of SAI or KAI
4. Because of toe-in

10-56. The difference in the distance between the wheel centers at the rear of the front tires and the wheel centers at the front of the tires is known by what terminology?

1. Steering axis inclination
2. Toe-in or toe-out
3. Caster
4. Camber

10-57. What is the purpose of toe-in?

1. To make sure the front wheels are turning about a common point
2. To make sure the inside wheel turns at a greater angle than the outside wheel
3. To allow or compensate for the normal looseness in steering linkage
4. To make sure the outside wheel turns at a greater angle than the inside wheel

10-58. How is toe-in adjusted?

1. By shortening or lengthening the tie rods
2. By shortening or lengthening the relay rod
3. By shimming the control arms
4. By shortening or lengthening the drag link